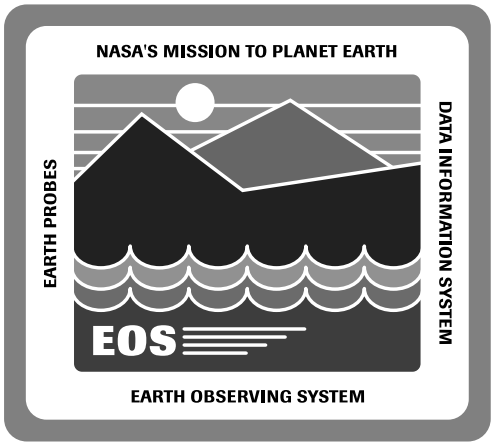


ECS Risk Management

George Percivall

28 February 1995

ECS Program Risk Management

ECS Risk Management Panel

PRIORITIZED RISK LIST

Programmatic

P-3 Compressed Development Schedule

Communications Technology

T-9 DCE Immaturity for Release A

T-1 CORBA Immaturity for Release B

T-10 Object Management Framework Availiability

Storage Technology

T-5 Cost Effective Storage Technology

T-4 COTS Hierarchical Storage Management

T-8 Scalability & Maintainability of Archive

T-7 Data Base Management Systems

User Interaction

U-1 Number and Activity of Users

U-4 Processing & Storage for Standard Products

INTEGRATED MITIGATION PLAN

	94	95	96	97
MILESTONES	PDR	CDR	RRR	
STRATEGIC DECISIONS				
PROTOTYPES				

Risk Status at SDR

Segment PDR Key Issues

PRIORITIZED RISK LIST

Push and Pull

U-4 Processing and Storage of Standard Products

S-7 Production Planning and Scheduling

U-1 Number and Activity of Users

T-7 Data Base Management Systems

Infrastructure

A-7 CSS Performance Overhead

T-11 CSMS Services by Platform

Archive Storage

T-5 Cost Effective Storage Technology

T-4 COTS Hierarchical Storage Management

T-8 Scalability & Maintainability of Archive

System Development

A-6 COTS Full Life Cycle Cost and Management

P-3 Compressed Development Schedule

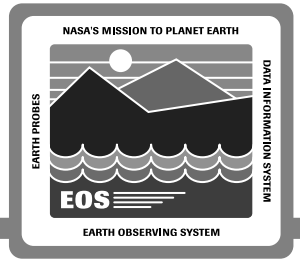
P-7 Ops Concept and Multi-Segment Integration

INTEGRATED MITIGATION PLAN

	94	95	96	97
MILESTONES	PDR	CDR	RRR	
STRATEGIC DECISIONS				
PROTOTYPES				

Risk Status at PDR

Prioritized Risk List at SDR



Programmatic

P-3 Compressed Development Schedule

Communications Technology

T-9 DCE Immaturity for Release A

T-1 CORBA Immaturity for Release B

T-10 Object Management Framework Availability

Storage Technology

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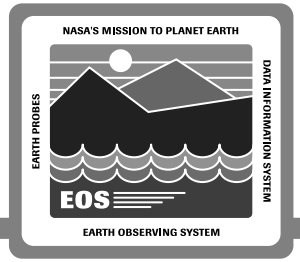
T-7 Data Base Management Systems

User Interaction

U-1 Number and Activity of Users

U-4 Processing & Storage for Standard Products

Changes to SDR Prioritized Risk List



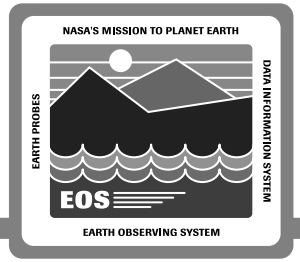
Downgraded Risk Items

- **T-9 DCE Immaturity for Release A**
- **T-1 CORBA Immaturity for Release B**
- **T-10 Object Management Framework Availability**

New Priority Risk Items

- **S-7 Production Planning and Scheduling**
- **A-7 CSS Performance Overhead**
- **T-11 CSMS Services by Platform**
- **A-6 COTS Full Life Cycle Cost and Management**
- **P-7 Operations Concept and Multi-Segment Integration**

Prioritized Risk List for PDR



Push and Pull

U-4 Processing and Storage of Standard Products
S-7 Production Planning and Scheduling
U-1 Number and Activity of Users
T-7 Data Base Management Systems

Infrastructure

A-7 CSS Performance Overhead
T-11 CSMS Services by Platform

Archive Storage

T-5 Cost Effective Storage Technology
T-4 COTS Hierarchical Storage Management
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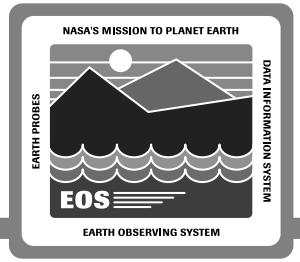
System Development

A-6 COTS Full Life Cycle Cost and Management
P-3 Compressed Development Schedule
P-7 Ops Concept and Multi-Segment Integration

ECS Priority Risks: Push and Pull

	Risk Item Summary	Major ECS Mitigation Activities
U-4	**Processing and Storage for Standard Products** - Growth in science algorithms may exceed available resources of processing and storage	• Ad-Hoc Working Group on Production • Data Processing Prototype • Science/Software Execution Prototype • Performance Modeling • Reprocessing Impact Study
S-7	**Production Planning and Scheduling** - COTS implementation may not meet requirements for Release B planning and scheduling	• Planning and Scheduling Prototypes • Planning and Scheduling Workshop • Development Effort Accounts for COTS Risk
U-1	**Number and Activity of Users** - Accurate prediction of usage difficult based on past experience - System usage expected to evolve - Inter-site traffic dependent on data set usage	• Ad-Hoc Working Group on Consumption • User Modeling Studies • Performance Modeling • Collaborative Prototyping Testbed • On Demand Processing Study • Technical Baseline Management
T-7	**Data Base Management Systems** - A single commercial DBMS may not meet ECS functional and performance requirements for spatial, temporal, coincident search	• Data Server Architecture Study • Data Type Services Prototype • Local Information Manager Prototype • DBMS COTS Encapsulation Prototype

ECS Priority Risks: Infrastructure



	Risk Item Summary	Major ECS Mitigation Activities
A-7	**CSS Performance Overhead** - Wrapping OODCE Objects with OMG/CORBA Interfaces - Performance risk associated with CSS overhead	• Interim Release 1 Evaluations • Interface Definitions in Programmers Guide • CSS Performance Testing (Sockets and RPCs) • DFS, NFS Performance Evaluation
T-11	**CSMS Services by Platform** - What platforms will be supported in IR1 and Release A with CSMS services	• DCE for IR-1widely available • OODCE for Release A • Platform Selection presented at CDR

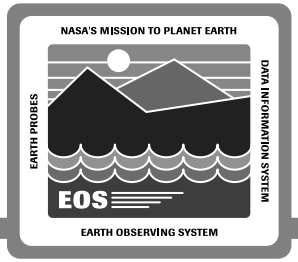
ECS Program Risks: Storage Technology

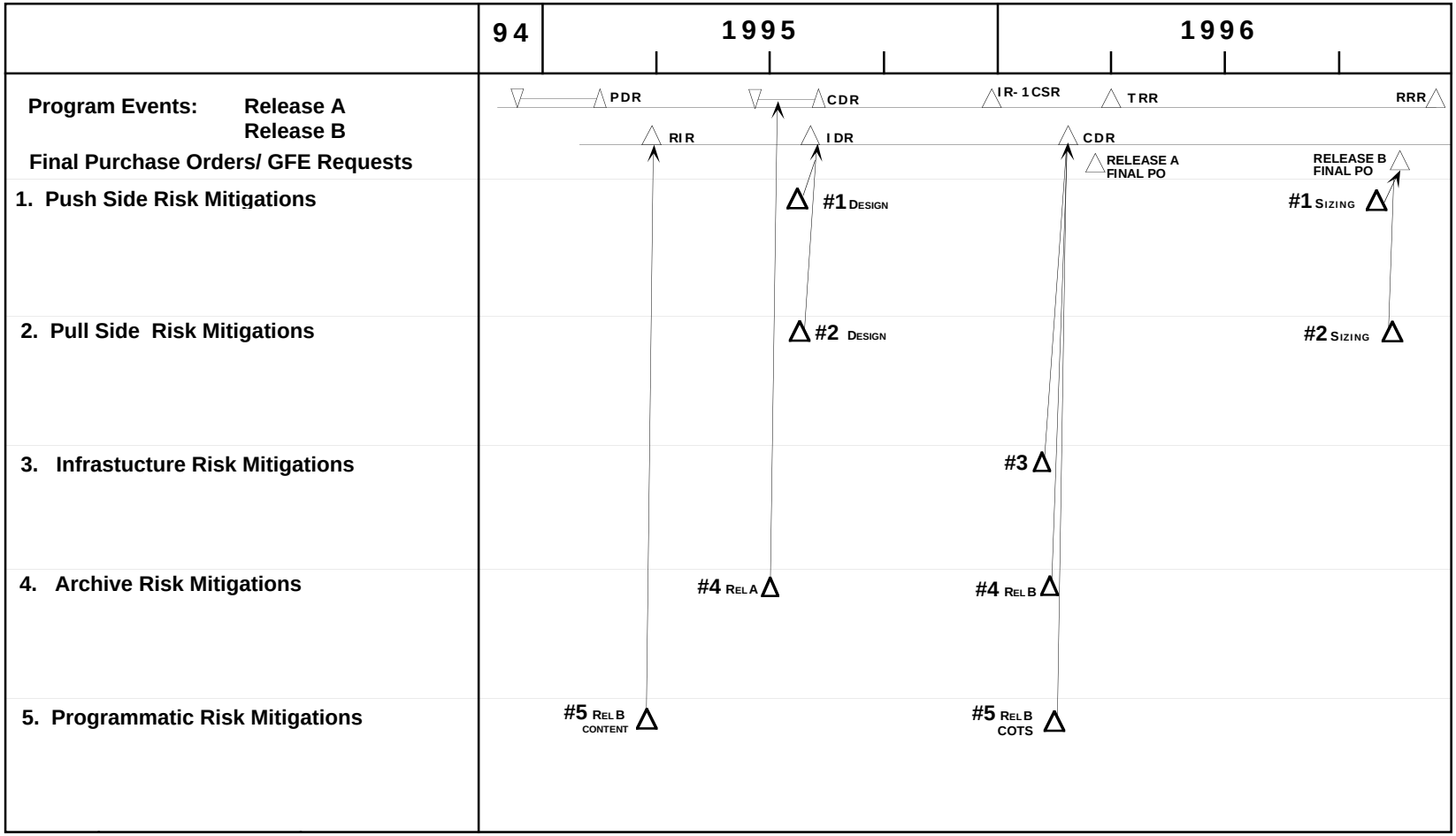
	Risk Item Summary	Major ECS Mitigation Activities
T-5	**Cost Effective Storage Technology** - Meeting allocated floor space, storage cost; given capacity, performance, and RMA requirements	• Storage Technology Insertion Plan • Data Compression Studies • Permanent Data Storage Tech. Study
T-4	**COTS Hierarchical Storage Management** - COTS storage management systems and distributed file systems reliability and performance. - HSMs could be limiting factor in the system performance	• Multi-FSMS Integration Evaluation • FSMS Implementation Study • MR-AFS Proof of Concept • Network Attached Storage Prototype
T-8	**Scalability & Maintainability of Archive** - Scalability of current systems - Maintainability of large, long-lived archives - Smaller system approaches not viable for ECS	• Network Attached Storage Prototype • FSMS COTS Encapsulation Prototype • Data Server Prototype in EP6 • Data Back-up Strategy Study

ECS Priority Risks: System Development

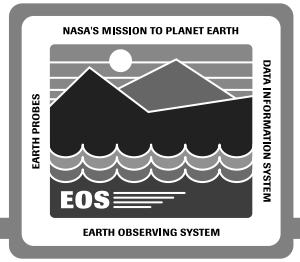
	Risk Item Summary	Major ECS Mitigation Activities
P-3	**Compressed Development Schedule** - Comparison with other Hughes Programs of similar size questions ECS ability to achieve assigned functionality for defined release dates	• ECS Release Plan • PDR Technical Baseline • Refine LOC Estimates by Release • Model the Development Effort • COTS Intensive Selection Guidelines • Eliminate Segment to System I&T Hand-off • Focused Development Teams
P-7	**Operations Concept and Multi-Segment Integration** - Refine operations concepts for system usage for verification of system and segment designs - CSMS Key Issue RID also adopted by SDPS board	• Operations Concept Document (604) • Detailed Design Scenarios • Operations Telecons • Ops Scenario Workshop
A-6	**COTS Full Life Cycle Cost and Management** May have underestimated the acutal cost of COTS - Integration - “Glue” code and configuration effort - Upgrades/Maintenance in operations	• SLOC estimates currently include “Glue” and configuration effort • COTS prototyping approach • M&O Effort includes COTS Maintenance • SEER and Boehm based Modeling • Metrics to be developed

Linking Risk Resolution to Program Milestones





Integrated Risk Mitigation Plan



Key Risk Mitigations	94	1995	1996
Program Events: Release A, Release B		PDR, CDR, IR-1 CSR, TRR, RRR	
		RIR, IDR, CDR	
Final Purchase Orders/ GFE Requests		RELEASE A FINAL PO	RELEASE B FINAL PO
1. Push Side Risk Mitigations		#1 DESIGN	#1 SIZING
• Data Processing Prototype			
• Performance Modeling			
• Planning and Scheduling Prototypes			
• Planning and Scheduling Workshop			
2. Pull Side Risk Mitigations		#2 DESIGN	#2 SIZING
• User Modeling Studies			
• Collaborative Prototyping Testbed			
• Local Information Manager Prototype			
• DBMS COTS Encapsulation Prototype			
3. Infrastucture Risk Mitigations		#3	
• Interim Release 1			
• Programmers Guide		1ST DRAFT	
• CSS Performance Testing			
4. Archive Risk Mitigations		#4 REL A, REVISION	#4 REL B
• Storage Technology Insertion Plan			
• Network Attached Storage Prototype		POC	
• FSMS COTS Encapsulation Prototype			
• Data Server Prototype in EP6		EP6	
5. Programmatic Risk Mitigations		#5 REL B CONTENT	#5 REL B COTS
• ECS Release Plan			
• PDR Technical Baseline			
• Operations Concept Document (604)			
• Ops Scenario Workshop			